

Name: _____ Date: _____
 Algebra 2/Trig H: The Normal Distribution (Day 2)

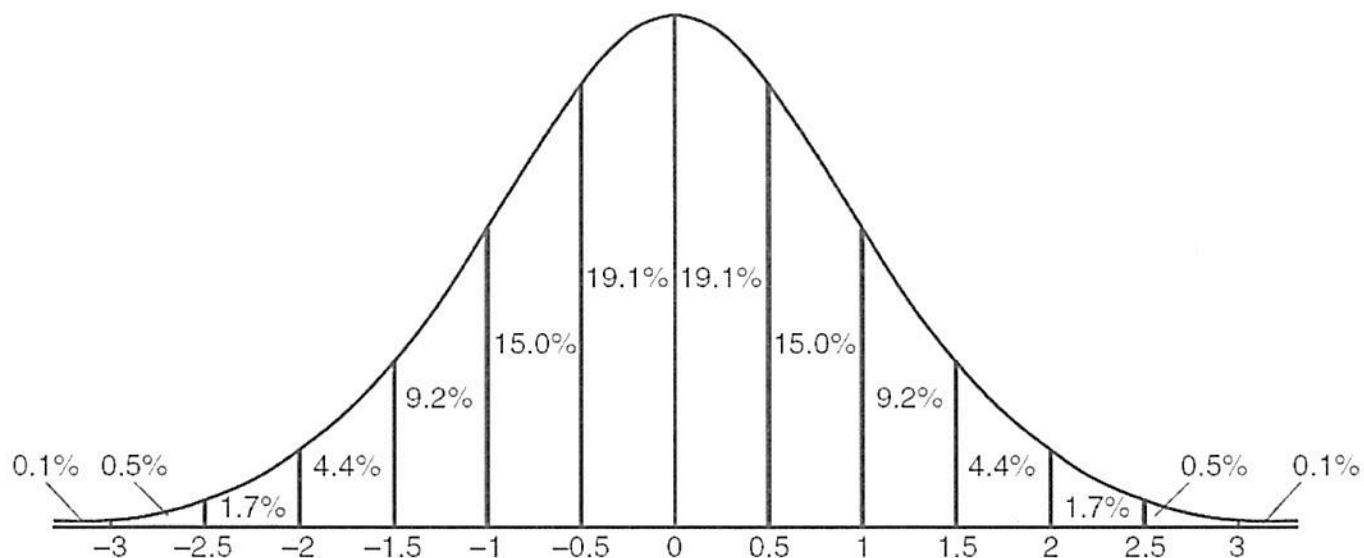
DO NOW: (Review)

Two forces act on an object. The angles between the resultant and the two forces are 30° and 40° . If the resultant force is 25 pounds, what is the strength of the smaller force?

REMINDER: To reset your calculator's settings (Graphs, Tables, Statistics Data, etc) Use these steps:

- 1) Go to the home screen
 - 2) Press: 2^{nd} , +, 7, 1, 2, (clear)
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Normal Curve Standard Deviation



1) The number of hours spent watching TV by students in this class is **normally distributed**. The average is 15 hours, with a standard deviation of 2.8 hours.

a) Make a number line to model this.

b) If I randomly pick one of you, what is the probability that the person I pick watches TV between 12.2 and 16.4 hours per week?

2) The mean number of hours of sleep that a student this class gets is 5.9 hours per night, with a standard deviation of .86 hours. (Assume the data is **normally distributed**) If I randomly select one of you...

a) What is $P(\text{student gets } 5.9 \text{ hours of sleep or more})$?

b) What is $P(\text{student gets } 7.62 \text{ hours of sleep or more})$?

3) In a certain school district, the ages of all new teachers hired during the last 5 years are normally distributed. Within this curve, 95.4% of the ages, centered about the mean, are between 24.6 and 37.4 years. Find the mean age and the standard deviation of the data.

STRATEGY:

- 1) NO MATTER WHAT... "Standard deviation" = DRAW A NUMBER LINE!!!
- 2) If the data is **normally distributed**, you can use the chart.
- 3) If the data is NOT normally distributed, you can find the mean and standard deviation using your _____.

- 4) From 1984 to 1995, the winning scores for a golf tournament were 276, 279, 279, 277, 278, 278, 280, 282, 285, 272, 279, and 278. Using the standard deviation for the sample, S_x , find the percent of these winning scores that fall within one standard deviation of the mean.

- 5) GOLF SCORES:

Score	Frequency
70	4
73	3
75	2
80	3
85	1
86	1
90	2
92	1

Find the population standard deviation of this set of students' scores, to the *nearest tenth*.

How many of the individual students' golf scores fall within one population standard deviation of the mean?

Score (x_i)	Frequency (f_i)
140	4
145	3
150	2

Find, to the *nearest tenth*, the population standard deviation of these scores.

How many of the scores fall within one standard deviation of the mean?

- 7) The number of children of each of the first 41 United States presidents is given in the accompanying table. For this population, determine the mean and the standard deviation to the *nearest tenth*.

How many of these presidents fall within one standard deviation of the mean?

Number of Children (x_i)	Number of Presidents (f_i)
0	6
1	2
2	8
3	6
4	7
5	3
6	5
7	1
8	1
10	1
15	1

- 8) ice tests she took this semester are is population, how many scores are within one standard deviation of the mean?

- 9) Mrs. Ramírez is a real estate broker. Last month, the sale prices of homes in her area approximated a normal distribution with a mean of \$150,000 and a standard deviation of \$25,000.

A house had a sale price of \$175,000. What is the percentile rank of its sale price, to the *nearest whole number*? Explain what that percentile means.

Mrs. Ramírez told a customer that most of the houses sold last month had selling prices between \$125,000 and \$175,000. Explain why she is correct.

- 10) On a standardized test, the distribution of scores is normal, the mean of the scores is 75, and the standard deviation is 5.8. If a student scored 83, the student's score ranks

- (1) below the 75th percentile
- (2) between the 75th percentile and the 84th percentile
- (3) between the 84th percentile and the 97th percentile
- (4) above the 97th percentile

- 11) In a New York City high school, a survey revealed the mean amount of cola consumed each week was 12 bottles and the standard deviation was 2.8 bottles. Assuming the survey represents a normal distribution, how many bottles of cola per week will approximately 68.2% of the students drink?

- (1) 6.4 to 12
- (2) 6.4 to 17.6
- (3) 9.2 to 14.8
- (4) 12 to 20.4

- 12) The amount of ketchup dispensed from a machine at Hamburger Palace is normally distributed with a mean of 0.9 ounce and a standard deviation of 0.1 ounce. If the machine is used 500 times, approximately how many times will it be expected to dispense 1 or more ounces of ketchup?

(1) 5 (3) 80
(2) 16 (4) 100

- 13) An electronics company produces a headphone set that can be adjusted to accommodate different-sized heads. Research into the distance between the top of people's heads and the top of their ears produced the following data, in inches:

4.5, 4.8, 6.2, 5.5, 5.6, 5.4, 5.8, 6.0, 5.8, 6.2, 4.6, 5.0, 5.4, 5.8

The company decides to design their headphones to accommodate three standard deviations from the mean. Find, to the *nearest tenth*, the mean, the standard deviation, and the range of distances that must be accommodated.

If you get stuck, draw a number line. It will help, I promise ☺